



## PATENT APPLICATION

### IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q73669

Takashi UDAGAWA , et al.

Appln. No.: 10/714,612

Group Art Unit: Not Yet Assigned

Confirmation No.: 3675

Examiner: Not Yet Assigned

Filed: November 18, 2003

For: BORON PHOSPHIDE-BASED SEMICONDUCTOR LIGHT-EMITTING DEVICE,  
PRODUCTION METHOD THEREOF AND LIGHT-EMITTING DIODE

#### **INFORMATION DISCLOSURE STATEMENT** **UNDER 37 C.F.R. §§ 1.97 and 1.98**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure under 37 C.F.R. § 1.56, Applicant hereby notifies the U.S. Patent and Trademark Office of the documents which are listed on the attached PTO/SB/08 A & B (modified) form and/or listed herein and which the Examiner may deem material to patentability of the claims of the above-identified application.

One copy of each of the listed documents is submitted herewith.

The present Information Disclosure Statement is being filed: (1) No later than three months from the application's filing date; (2) Before the mailing date of the first Office Action on the merits (whichever is later); or (3) Before the mailing date of the first Office Action after filing a request for continued examination (RCE) under § 1.114, and therefore, no Statement under 37 C.F.R. § 1.97(e) or fee under 37 C.F.R. § 1.17(p) is required.

In compliance with the concise explanation requirement under 37 C.F.R. § 1.98(a)(3) for foreign language documents, Applicant submit the following:

Information List (Form 1) listing four (4) Japanese Applications;

Information List (Form 1) listing seven (7) Japanese Applications and twelve (12) publications, and the related Information List (Form 2) listing the patent family members related to the seven (7) Japanese Applications.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicant does not waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,



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WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

Date: May 12, 2004

Substitute for Form 1449 A & B/PTO		<b>Complete if Known</b>	
		Application Number	10/714,612
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (use as many sheets as necessary)		Confirmation Number	3675
		Filing Date	November 18, 2003
		First Named Inventor	Takashi UDAGAWA
		Art Unit	Not Yet Assigned
		Examiner Name	Not Yet Assigned
		Attorney Docket Number	Q73669
Sheet	1 of 2		

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		Number	Kind Code <sup>2</sup> (if known)		
		US 3,054,936		09-18-1962	WILLIAMS et al.
		US 3,022,452		02-20-1962	WILLIAMS et al.

FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Translation <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
		JP	2001-168395		06-22-2001	SHOWA DENKO KK	Abstract
		JP	2002-270896		09-20-2002	SHOWA DENKO KK	Abstract
		JP	2002-368260		12-20-2002	SHOWA DENKO KK	Abstract
		JP	2003-23181		01-24-2003	SHOWA DENKO KK	Abstract
		JP	49-19782		02-21-1974		
		JP	53-20882		02-25-1978	IBM	
		JP	2-288388		11-28-1990	TOSHIBA CORP	Abstract
		JP	6-260680		09-16-1994	NICHIA CHEM IND LTD	Abstract
		JP	10-242569		09-11-1998	TOSHIBA CORP	Abstract
		JP	11-40890		02-12-1999	NEC CORP	Abstract
		JP	2000-133884		05-12-2000	SHOWA DENKO KK	Abstract

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	Translation <sup>6</sup>
		Japanese Search Report for PCT/JP03/14597 dated January 20, 2004 (Japanese language)	
		P. POPPER, et al.; "Boron phosphide, a III-V Compound of Zinc-Blende Structure"; Nature; No. 4569, May 25, 1997, p. 1075	
		J. PERET; "Preparation and Properties of the Boron Phosphides"; Journal of The American Ceramic Society, Vol. 47, No. 1, January 1964; pp. 44-46	
		Takao TAKENAKA et al.; "Diffusion Layers Formed in Si Substrates during the Epitaxial Growth of BP and Application to Devices"; Journal of Electrochemical Society, Vol. 125, No. 4, April 1978, pp. 633-636	
		K. SEEGER; "Semiconductor Physics, An Introduction"; Fourth Edition, Springer-Verlag Heidelberg, 1989	
		K. SHOHNO; "Semiconductor Techniques", 9th issue, University of Tokyo Press, pp. 74-77	
		T. IZUMIYA; "Growth of BP and GaN/BP heterostructures"; Phys. Conf. Ser., No. 129, 1993, pp. 157-162	
		I. AKASAKI; "Group III-V Compound Semiconductor"; Baifukan Co., Ltd., first edition, Chapter 13	
		K. SHOHNO, et al.; "Epitaxial Growth of BP Compounds on Si Substrates Using the B <sub>2</sub> H <sub>6</sub> -PH <sub>3</sub> -H <sub>2</sub> System"; Journal of Crystal Growth, 24/25, 1974, pp. 193-196	
		"Epitaxial Growth of BP Single Crystal"; Shonan Institute of Technology, 24aB11, p. 150	
		Y. KUMASIRO, et al.; "Preparation and Electrical Properties of Boron and Boron Phosphide Films Obtained by Gas Source Molecular Beam Deposition"; Journal of Solid State Chemistry, Vol. 133, 1997, pp. 269-272	
		I. AKASAKI; "Group III Nitride Semiconductor"; Baifukan Co., Ltd., first edition, Chapters 13 and 14	

Examiner Signature	Date Considered
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov), MPEP 901.04 or follow the hyperlink from the title of the document to the intranet. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST. 3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to indicate here if English language Translation is attached.